## ABSTRACT

A power amplifier for receiving an input signal and providing a corresponding amplified output signal. One embodiment of the power amplifier includes a positive half circuit for supplying power to an amplifier during positive half waves of the output signal and a negative half circuit for supplying power to the amplifier during negative half waves of the output signal. Each half circuit has a main power supply, which is typically a switching regulator, and which supplies a first power signal to the amplifier. The slew rate of this first power signal is intentionally limited to control EMI emissions. Each half circuit also has a transient power supply which may be selectively engaged to provide a second power signal to the amplifier when the first power signal is insufficient to power the amplifier. Each half circuit may also include a low voltage power supply which provides a third power signal to the amplifier, allowing the main power supply to be disabled when a low power level is required, further reducing EMI emissions. Each half circuit has a control circuit which regulates the power output from the main and transient power supplies. The control circuit may provide a pulse width modulated control signal or a pulse density modulated control signal to control the switching regulator. If a pulse density control signal is provided, the switching regulator may be a resonant switching regulator. The power amplifier may be modified for use with a bridge amplifier, with multiple channels and may incorporate an overload detection circuit. In another embodiment of power amplifier the transient power supply is replaced with a transient control circuit that, when the first power supply is insufficient to power the amplifier, temporarily forces the first power supply to a 100% duty cycle, and then for a longer period, increases the duty cycle from its normal level to allow the first power supply to adequately power the amplifier more quickly.